

PARVULODESMUS PROLIXOGONUS, A NEW GENUS
AND SPECIES OF XYSTODESMID MILLIPED
FROM SOUTH CAROLINA (POLYDESMIDA)

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Abstract.—The minute xystodesmid milliped, *Parvulodesmus prolixogonus*, is described as a new genus and species from a sample collected 30 years ago in Abbeville, South Carolina. The principal diagnostic character is a long, slender acropodite, which overlaps the sterna of segments 4–6 and curves dorsad into a small apical loop. The species is assigned to the tribe Rhysodesmini on the basis of gonopodal traits, small body size, and sternal hairs.

For the past six years I have been investigating the endemic xystodesmid milliped fauna of piedmont South Carolina, diagnosing three new genera in the tribe Apheloriini—*Croatania*, *Brevigonus*, and *Furcillaria* (Shelley 1977, 1980, 1981a), and describing other species in a revision of *Sigmoria* (1981b) and a second paper on *Brevigonus* (1981c). I have visited the area around Abbeville, Abbeville County, four times searching for a purported new species of the tribe Rhysodesmini that Leslie Hubricht collected in the early 1950s. Richard L. Hoffman, who examined the milliped at the time of its collection, told me of its existence and that it represented a new genus. Unfortunately, no gonopod drawings were available, and the preserved specimens were not in his private collection nor in any major museum in the eastern United States. Re-collection of the species therefore seemed necessary, and I visited Abbeville in spring, summer, and fall, to allow for seasonal occurrence. These efforts, however, were unsuccessful.

In 1981 the milliped collection of the late William T. Keeton, former Professor of Biology at Cornell University, was transferred to Dr. Hoffman to be incorporated into his holdings. While casually perusing this material one day, I chanced upon the long lost sample from Abbeville, which contained two males and two females in good condition. However, the gonopods had been removed from one male and were not in the vial. Consequently, the critically important genitalic features can only be determined from the other male, which I designate the holotype. These are the smallest xystodesmids I know of, smaller even than *Gyalostethus monticolens* (Chamberlin) or *Pleuroloma pinicola* Shelley, and I agree completely with Dr. Hoffman that they represent a new genus and species in the tribe Rhysodesmini.

Parvulodesmus, new genus

Type species.—*Parvulodesmus prolixogonus*, new species.

Description.—A genus of minute rhysodesmine xystodesmids with the following characteristics:

Body composed of head and 20 segments in both sexes; W/L ratio 21–24%. Head of normal appearance, smooth; epicranial suture distinct, not bifid; facial

setae reduced, epicranial and interantennal absent. Antennae moderately long, with 4 small, apical sensory cones.

Terga smooth, strictures faint. Collum large and broad, but not extending beyond ends of following tergite. Paranota strongly depressed; peritremata flat and inconspicuous on all segments, ozopores opening laterad.

Caudal segments normal for family.

Pregonopodal sterna of males with variable concave depressions; postgonopodal sterna of males and all sterna of females flat and unmodified, with small clusters of setae beside leg coxae. Gonapophyses of males short and apically expanded. Coxae without ventrodiscal spines or tubercles; prefemoral spines short and blunt, greatly reduced, absent from some legs.

Gonopodal aperture relatively large, elliptical. Gonopods with very long acropodites, overlapping apically but otherwise parallel to each other, extending forward from aperture between legs of segments 6, 5, and 4, lying in sternal depressions. Coxae small, without apophyses. Prefemora small, with short, acicular processes. Acropodites long, thin, and flat, curving dorsad into narrow loops apically, with medial subterminal digitiform processes.

Cyphopodal aperture narrow, encircling second legs. Cyphopods minute but with comparatively large, rugulose receptacles overlying ventral valves. Valves small and subequal; operculum not detectable but presumed present under free end of valves.

Species.—One is known; others may also occur in piedmont South Carolina.

Relationships.—*Parvulodesmus* appears to be most closely related to several undiagnosed rhyodesmine species in the Gulf Coastal Plain of southern Alabama. These species, which constitute one or possibly two new genera, also have long gonopodal acropodites that overlap two or more sterna anterior to the gonopodal aperture.

Parvulodesmus prolixogonus, new species

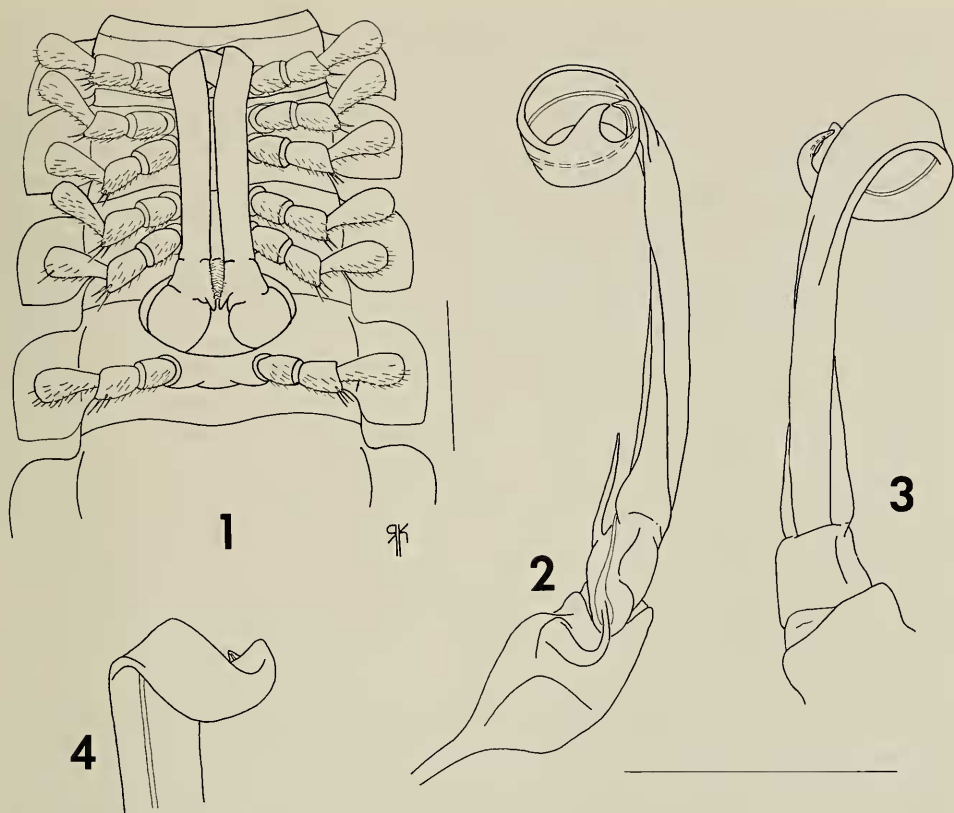
Figs. 1-4

Type specimens.—Male holotype, and one male and two female paratypes (collection of R. L. Hoffman) collected by Leslie Hubricht, 1 May 1952, from Abbeville, Abbeville Co., South Carolina.

Diagnosis.—With the characters of the genus.

Holotype.—Length 14.7 mm, maximum width 3.1 mm, W/L ratio 21.1%, depth/width ratio 58.1%. Color in life unknown; all specimens completely blanched by preservative, without any evidence of stripes or other pigmentation patterns.

Head capsule smooth, polished; epicranial suture thin but distinct, terminating in slight impression in interantennal region, not bifid. Antennae moderately long and slender; reaching back to middle of fourth tergite, becoming progressively more hirsute distally, with 4 apical sensory cones, no other sensory structures apparent, first antennomere subglobose, 2-6 clavate, 7 short and truncate; relative lengths of antennomeres $3 > 2 > 4 > 5 = 6 > 1 > 7$. Genae not margined laterally, with distinct medial impressions, ends broadly rounded and projecting slightly beyond adjacent cranial margins. Facial setae as follows: epicranial, interantennal, frontal, and genal not detected, subantennal 1-1, clypeal about 8-8, labral about 12-12.



Figs. 1-4. *Parvulodesmus prolixogonus*. 1, Gonopods *in situ*, ventral view of holotype. 2, Left gonopod of holotype, medial view. 3, Telopodite of the same, lateral view. 4, Distal half of acropodite, oblique dorsal view. Scale line for fig. 1 = 1.00 mm; line for other figs. = 1.00 mm for each.

Terga smooth, polished. Collum broad, ends not produced beyond those of following tergite. Paranota strongly depressed, angled sharply ventrad and continuing slope of dorsum; anterior corners rounded, caudolateral corners blunt on all segments; posterior edges of paranota only slightly discontinuous with dorsum. Peritremata thin and inconspicuous, only slightly elevated above paranotal surface; ozopores located near middle of peritremata, opening laterad.

Sides of metazonites finely granular, without noticeable grooves or impressions. Strictures faint, indistinct. Sterna of segments 4-6 with concave central depressions, deepest on segment 4, to accommodate stems of gonopodal acropodites; without lobes or other processes. Postgonopodal sterna without lobes, caudal edges straight; with shallow transverse grooves between leg pairs and short, longitudinal grooves between caudal legs; with 2 to 4 long, slender setae in small clusters near coxae of both leg pairs. Pregonopodal legs densely hirsute; postgonopodal legs becoming progressively less hirsute caudally. Coxae without projections; prefemora apically blunt and rounded, without spines; tarsal claws hooked, of normal length on all legs. Hypoproct rounded; paraprocts with margins slightly thickened.

Gonopodal aperture elliptical, with slight indentations anteriolaterad, margins elevated above metazonal surface, not thickened. Gonopods *in situ* (Fig. 1) with telopodites projecting ventrad from aperture, extending anteriorly in parallel arrangement over sterna of segments 6, 5, and 4, apices overlapping and interlocking between third pair of legs. Gonopod structure as follows (Figs. 2-4): Coxa small, without apophysis. Prefemur small, with short, acicular process arising on dorsal side, extending beyond juncture of prefemur and acropodite for about $\frac{1}{8}$ of length of latter. Acropodite demarcated from prefemur by slight constriction, in form of thin, narrow blade extending linearly from prefemur, with apical loop of narrow diameter; loop located at about $\frac{2}{3}$ length, curving dorsad from stem of acropodite, with subterminal digitiform projection on medial edge subtending small circular area between solenomerite; solenomerite short, apically acute, directed subanteriorly. Prostatic groove arising in pit in base of prefemur, crossing to dorsal side of acropodite at juncture with prefemur, running along inner surface of apical loop and opening terminally on solenomerite.

Male paratype.—The male paratype agrees with the holotype in all particulars except facial setae, which are as follows: epicranial and interantennal absent, subantennal 1-1, frontal 1-1, genal 2-2, clypeal about 8-8, labral about 12-12, merging with clypeal series and continuing along genal margins for about one-third of lengths, about 4 setae on each side. Gonopodal variation is unknown, since the paratype gonopods were previously dissected and lost.

Female paratype.—Length 13.1 mm, maximum width 3.2 mm. W/L ratio 24.4%, depth/width ratio 62.5%. Agreeing closely with males in somatic features except paranota more strongly depressed, creating appearance of more highly arched body, and lacking sternal depressions of pregonopodal segments of males. Cyphopods with comparatively large, subtriangular receptacle visible in aperture, lying over and obscuring valves, surface rugulose; valves small and subequal, located dorsad to receptacle, opening anteriorly, surfaces finely granulate.

Distribution.—Known only from the type locality.

Remarks.—The prefemoral process of *P. prolixogonus* can be easily overlooked or mistaken for a seta or cotton fiber, when the gonopod is placed on cotton for drawing. It is colorless, translucent, and closely appressed to the prefemur and base of the acropodite. Its shortness relative to the extremely long acropodite makes it look like a macroseta, and it blends into the acropodite and becomes nearly invisible in any view except medial, which reveals the narrow gap between them. The process is also very fragile and can be easily broken during gonopod dissection.

Parvulodesmus prolixogonus is assigned to the tribe Rhysodesmini because of the small body size, the hairs on the sterna, the parallel arrangement of the gonopods, and the acicular prefemoral process. These traits are all more typical of the Rhysodesmini than any other southeastern xystodesmid tribe. Small body size is shared with the genera *Gyalostethus*, *Caralinda*, and the undescribed Alabama taxa; hirsute sterna are exhibited by two species of *Pleuroloma*; and all rhysodesmine genera except *Caralinda* display acicular prefemoral processes and parallel gonopods. One rhysodesmine trait not observed was the sternal remnant connecting the gonopodal coxae. I neglected to check this character before dissecting the gonopods of the holotype, and the nature of the remnant will have to be determined from fresh material.

In trying to discover more specimens near Abbeville, I checked a wide variety of biotopes in every habitat I could think of. I also wrote the collector, but he could only remember that the sample was taken near the railroad. Many of the places I investigated were urbanized sites in or near Abbeville, and one trip came during the last week of April, the same time of year that the type sample was collected. Thus, I think I checked, at the proper time of year, the kinds of sites Hubricht did. On the thought that Abbeville might be at the range periphery where the species is least common, I investigated distant parts of the county and adjacent McCormick, Greenwood, and Anderson counties, to try to find an area of greater abundance. Although not specifically looking for *Parvulodesmus*, I have also investigated thoroughly during the past six years the entire Piedmont of South Carolina and, to a lesser extent, the tier of counties along the southern side of the Savannah River in Georgia. However, trying to find such a tiny animal in such a large area with no habitat information is exceedingly difficult, and it is not surprising that none of these activities were successful. I think that the situation with *Parvulodesmus* may be similar to that of *Caralinda* in southern Georgia, Alabama, and neighboring Florida. In this genus single species were described by Hoffman (1978) and me (1979), but I have recently discovered a large amount of *Caralinda* from the Florida panhandle in the Florida State Collection of Arthropods, containing two or three more new species. Thus, *Caralinda* consists of four to five species and occupies a much larger area than previously thought. Similarly, *Parvulodesmus* may also consist of two or more species and occupy a much larger area in South Carolina than just Abbeville County. However, I have exhausted all my knowledge and field experience trying to find more individuals, and my only further thought is that May might be the time of least abundance. Perhaps the species of *Parvulodesmus*, like *Nannaria conservata* Chamberlin (Shelley 1975), are most abundant during the winter months and are prevalent in December, January, and February. I leave this idea for future investigators, who may be challenged by the rarity of *Parvulodesmus*, or local biologists, who live in the Abbeville-Greenwood area and can sample in winter and continuously throughout the year. A continuous, long-term effort of this kind may be required to find *Parvulodesmus* again.

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